

**REMARKS**

Claims 1, 6, 7, 13, and 17-32 are pending in this application. The Office Action objects to the title; rejects claims 9-12 under 35 U.S.C. §112, second paragraph; rejects claims 1 and 6-8 under 35 U.S.C. §102(b); and rejects claims 2-5 and 9-16 under 35 U.S.C. §103(a). Applicants hereby amend the title, claims 1, 7 and 13, cancel claims 2-5, 8-12 and 14-16, and add new claims 17-32. Support for the new claims can be found, for example, at pages 1, 2, 4, 5, 8, 10 and 13 of the specification. No new matter is added.

**I. Title**

The Office Action objects to the title of the invention for not being descriptive. Applicants hereby amend the title of the invention to recite "MACHINE TOOL ANALYSIS DEVICE AND METHOD."

For at least the foregoing reasons, the title is descriptive of the invention. Withdrawal of the objection is earnestly solicited.

**II. Rejections under 35 U.S.C. §112, second paragraph**

The Office Action rejects claims 9-12 under 35 U.S.C. §112, second paragraph, as being indefinite. The Office Action asserts that "the emitter" lacks antecedent basis. Applicants hereby amend claims 1, 7 and 13, cancel claims 2-5, 8-12 and 14-16, add new claims 17-32, and respectfully traverse the rejection.

Independent claim 7 has been amended to include recitation of an "emitter." Further, instant claims 9-12 are canceled. Thus, the features of the instant pending claims contain proper antecedent basis.

Reconsideration and withdrawal of the rejection are earnestly solicited.

**III. Rejections under 35 U.S.C. §102**

The Office Action separately rejects claims 1 and 6-8 under 35 U.S.C. §102(b) as being anticipated by Gelston and Brooks. The Office Action asserts that Gelston and Brooks

each disclose each feature of instant claims 1 and 6-8. Applicants hereby amend claims 1,7, and 13, cancel claims 2-5, 8-12 and 14-16, add new claims 17-32, and respectfully traverse the rejections.

Applicants incorporate the subject matter of non-rejected claim 3 into independent claims 1, 7 and 21, from which all other claims depend. As admitted in the Office Action, neither Gelston nor Brooks specifically disclose the features of claim 3. See pages 4 and 5 of the Office Action. Thus, the anticipation rejections are overcome.

For at least the foregoing reasons, the claims are not anticipated by Gelston or Brooks. Reconsideration and withdrawal of the rejection are earnestly solicited.

**IV. Rejections under 35 U.S.C. §103(a)**

The Office Action separately rejects claims 2-5 and 9-16 under 35 U.S.C. §103(a) over Gelston and Brooks. The Office Action asserts that although neither Gelston nor Brooks specifically disclose the data conditions as claimed, choosing a particular data condition would require only routine skill in the art. Further, it would allegedly have been obvious to an ordinarily skilled artisan to provide any of the claimed data conditions in the apparatus and method of Brooks to properly identify the conditions, states or positions of the tool. Applicants hereby amend instant claims 1, 7 and 13, cancel claims 2-5, 8-12 and 14-16, add new claims 17-32, and respectfully traverse the rejections.

Gelston describes detecting the signature of microwave radiation reflected from a cutting tool before, during and after the tool is used to drill a hole in a printed circuit board. In determining time of tool contact, Gelston looks for a sharp transition in a curve. Further, Gelston describes comparing new and previously acquired reference waveforms. By comparing a certain waveform property (e.g., a sharp transition) between the newly acquired waveform and a previous reference waveform, Gelston's invention can ascertain tool condition. Gelston, however, nowhere discloses analyzing a curve to find a series of

minimum values or assessing if such values conform to an expected curve type. Moreover, Gelston nowhere discloses teaching minimum values associated with a succession of decreases in light received by a light receiver.

Additionally, Gelston's embodiments are directed toward systems using *microwave* radiation. In Gelston, laser systems are said to be suitable only for operations "wherein coolant is not used." Col. 9, line 57. Thus, in essence, Gelston appears to disclose that the claimed optical methods, which comprise a light emitter, would be unsuitable for tool detection purposes.

Brooks describes a device for measuring the properties of parts and does not disclose a tool analysis device or a method of using such tool analysis device. Rather, Brooks discloses a method for inspecting the profile parts on a rotary bowl parts feeder. See Fig. 1. In Brooks, the bolt is moved into a narrow optical beam and the amount of light reaching it is monitored and provides a characteristic signature for a given bolt against which the signature of further bolts are compared. See Fig. 5. Thus, any variations in shape or orientation of the bolt can be identified. Brooks thus teaches comparing a series of signatures to a reference signature. Col. 7, lines 5-11. However, Brooks nowhere discloses looking for the particular data conditions specified in instant claims 1, 7 and 21, nor does Brooks disclose producing an output signal when minimum or maximum values conform to a predetermined condition such as a curve expected by a processor.

In contrast, instant claims 1, 7 and 21 are directed toward determining and comparing minimum values of signal output. Moreover, instant claims 1, 7 and 21 specify that light is used. Advantageously, assessing minimum values of a measured curve against an expected reference curve allows, for example, a coolant drip rejection process to be implemented. See specification at page 8, line 26-page 9, line 2. Such unexpected benefits of allowing an optical tools analysis to be performed even when unexpected events, such as coolant drip,

occurs is nowhere taught or suggested in Gelston. Rather, Gelston teaches that the instant method is generally unsuitable for tool detection purposes. It would thus not have been obvious to modify Gelston to obtain the features of instant independent claims 1, 7 and 17, and claims dependent therefrom, at least because Gelston nowhere describes the comparison of minimum values, and teaches against the use of light.

It would also not have been obvious to modify Brooks in order to have the ability to detect tools of an arbitrary shape and to prevent unexpected events such as coolant drips from causing false triggering at least because Brooks is not directed toward a tool analysis device. Rather, Brooks is directed to a parts measuring device. Nowhere does Brooks provide any reason to detect tools of an arbitrary shape or to prevent unexpected events (e.g., coolant drips) that lead to false triggering. Thus, instant independent claims 1, 7 and 17, and claims dependent therefrom, would not have been obvious over Gelston.

For at least the foregoing reasons, instant independent claims 1, 7 and 21 and all claims dependent therefrom would not have been obvious in view of Brooks. Reconsideration and withdrawal of the rejection are earnestly solicited.

**V. Conclusion**

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the claims are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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